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मानक

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IS 14165 (1995): Handling of carcinogenic substances - code of safety [CHD 8: Occupational Safety, Health and Chemical Hazards]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS 14165 : 1995

(Reaffirmed 2002)

भारतीय मानक

कार्सिनोजिक पदार्थों का प्रहस्तन — सुरक्षा संहिता

Indian Standard

**HANDLING CARCINOGENIC SUBSTANCES —
CODE OF SAFETY**

UDC 614.878 : 661

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BUREAU OF INDIAN STANDARDS
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FOREWORD

Cancer causing agents or substances are called carcinogens, capable of inducing tumors; possible examples are chemicals, viruses and some type of radiations. Exposure over a number of years to small amounts of carcinogens may be sufficient to cause cancer, even though at the time of exposure(s) they may not produce any warning signs (such as odour) or symptoms (coughing or nausea) on entering the body.

Human exposure to carcinogens may occur in the work place through exposure to various industrial materials and processes. Seventy five percent cases of human cancer are influenced by extrinsic factors. Given the multiple sources of carcinogens in the work place and environment, it can be extremely difficult to attribute individual case of cancer to a single source. However, the reduction of exposure from any source should generally reduce the overall risk of cancer to humans. Effects of to carcinomutagenic and carcinogenic inducer can also be risk to humans.

The composition of technical committee responsible for the formulation of this Indian Standard is given in Annex A.

Considerable assistance has been derived from the following publications in preparing this code of safety:

- a) Alderson M. (1978) Industrial Cancer Whose Responsibility. Annals. Occup. Hyg. (1978) Vol 21, 285-291.
- b) Canadian Data Sheet of Occupational Safety and Health (Rev. 1985) I-2, Ontario, Canada.
- c) Carcinogenic Substances Control and Regulation. NIOSH.

Indian Standard

HANDLING CARCINOGENIC SUBSTANCES — CODE OF SAFETY

1 SCOPE

This code covers guidelines which should be followed while handling carcinogenic substances.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
4155 : 1966	Glossary of terms relating to chemical and radiation hazards and hazardous chemicals
4167 : 1980	Glossary of terms relating to air pollution (<i>first revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 4155 : 1966 and 4167 : 1980 shall apply.

4 PREVENTION MEASURES

4.1 The first line of defence is the recognition of the hazard. Maintain a list of known and suspected carcinogens used in the work place.

4.2 The second line of defence should be engineering controls at design stage. These controls which should strive to eliminate exposure to carcinogens, include a closed system, mechanical seals, remote controls, local ventilation or exhaust ventilation system.

4.3 In selecting engineering control measures, a number of factors should be considered by management such as carcinogenic potency; physical state (gas, vapour, liquid, fume, dust), particle size; reactivity and corrosiveness of the carcinogen; nature of the industrial process; amount of carcinogens handled; and duration of exposure.

4.4 Personal protective equipment should be used wherever required.

5 HAZARD ELIMINATION

Carcinogenic substances shall be replaced with less harmful substances where feasible.

6 HAZARD CONTROL

6.1 Processes to be Isolated

6.2 Closed systems should be used whenever possible. Operations which cannot be contained

should be provided with adequate local exhaust ventilation.

6.3 Continuous general mechanical exhaust ventilation should be provided to all areas (including storage) so that air movement is always from general work areas to the carcinogen-handling areas. Regular certification procedures must be in place to ensure that all air handling systems are working properly. The exhaust air should be discharged through a scrubber or flare system. In the case of failure of ventilation system, alarms and established evacuation procedure should be maintained.

6.4 In work areas where potentially high exposures may occur, it is essential to continuously monitor exposure levels.

6.5 Procedures should be established for removal and decontamination of carcinogens from equipment, material, clothing or other items.

6.6 Warning signs and instructions should be posted.

6.7 All containers of carcinogens should be labelled with instructions for safe handling.

6.8 Appropriate measures should be developed to prevent leakage or spillage.

7 SAFE WORK PRACTICES

7.1 Management, in conjunction with employees, should establish codes of practice for the safe use, storage and disposal of carcinogens.

7.2 Management should minimize the number of persons exposed and the duration and level of exposure, by job rotation if necessary.

7.3 Emergency procedures, including evacuation of personnel should be developed for areas where it is possible to have serious leaks and spills.

7.4 Adequate hygienic facilities and practices should be established for exposed workers as given below.

7.4.1 A double locker system adjacent to a carcinogen handling area, where each worker has a locker for street clothes in clean locker room and a locker for work clothes.

7.4.2 A shower room located between the two locker rooms so that each worker takes a shower before putting on street clothes.

7.4.3 Prior to leaving the carcinogen area, workers should leave their protective clothing and equipment at the point of exit. At the termination of shift workers should be required to place used clothing and equipment in impervious containers at the point of exit for the purpose of decontamination or disposal.

7.4.4 Workers should wash hands, forearms, face and neck on each exit from carcinogen-handling area, using facilities adjacent to the point of exit, and before engaging in other activities such as eating, drinking, smoking and using toilet facilities.

7.4.5 Workers should shower after the end of their shift.

7.4.6 Drinking fountains are not to be placed in the carcinogen handling area.

7.4.7 Eating, drinking, chewing or smoking are to be prohibited in the carcinogen-handling areas.

7.4.8 Dry sweeping is to be prohibited in carcinogen-handling areas. (Any vacuum cleaners used, should be equipped with high efficiency filters.)

8 SAFETY PROCEDURES FOR WORKERS

8.1 Approved protective clothing and respiratory equipment such as continuous air-supplied hoods or masks, impervious gloves, boots and overalls, shall be provided.

8.2 Decontamination of the protective garments and hoods should be done after use.

8.3 Workers should use the shower after removal of the protective garments.

8.4 Periodic medical check up of all employees should be carried out at a suitable frequency.

8.5 Workers having keratosis, warts or xeroderma (dryness of the skin) should not be employed in occupation where there is cancer hazard.

9 PERSONAL PROTECTIVE EQUIPMENT

If personal protective garments are used, they should be of the type which may be decontaminated or discarded after use, so that the worker may not accidentally inhale or ingest contaminants adhering to his clothing or body or contaminant does not remain in contact with the skin.

9.1 Provide workers with clean, complete body protective clothing, shoe, covers and gloves etc.

9.2 Provide workers engaged in specific carcinogen-handling operations with suitable respirators, approved for protection against the hazard in question.

9.3 Provision of safety showers and eye wash fountains, in the work areas.

10 WASTE DISPOSAL

Disposal methods should be used which do not permit carcinogens to be introduced into work areas and which do not pollute the external environment. Discharge to the environment shall be avoided to the extent possible or it shall be avoided in accordance with the relevant rules and regulations.

11 VIRUSES

Guidelines on the handling of recombinant DNA molecules and animal viruses and cells should be followed.

12 RADIATION

Radiation devices in ionizing and non-ionizing frequencies considered to be hazardous to health must be examined and approved.

12.1 Maintenance

Only specifically trained employees should be allowed to maintain or repair equipment contaminated with carcinogenic substances (including leaks, spills, and the replacement of filters in gas or liquid lines). In the case of an actual or a suspected spill all materials used in the clean up should be disposed off in accordance with an approved method for the particular chemical product involved.

12.2 All contaminated waste material shall be transported in leak-proof containers. The waste container should bear the sign: CAUTION—CANCER CAUSING AGENT. Where such work could result in direct contact with the carcinogen, employees may have to wear clean impervious garments gloves and boots and a hood continuously supplied with clean air. Before removing protective gear, employees must first decontaminate its outer surface, then place such clothing and gear in impervious, properly labelled containers for decontamination or disposal. Following removal, employees must take shower.

13 SECONDARY PREVENTION

This term is used for approaches that do not remove carcinogenic agent, but aim to identify disease at a stage when successful treatment can be applied. Screening of workers to identify disease by physical examination includes cytology on a specimen, urine, blood, chest x-ray, or periodic cytосcopy and other internal

examination, secondary prevention of cancer requires collaboration between management, individuals and the health Department.

14 EDUCATIONAL TRAINING PROGRAMME

Before being allowed to work with carcinogens, employees must receive specific training programme regularly in the following subjects; the carcinogenic potential of these substances; the kind of assignments which could result in exposure; decontamination and emergency procedures; the employees specific role in recognizing situations which may result in the release of these substances. This training must be repeated at appropriate intervals following the initial instruction.

14.1 Personnel Selection

14.1.1 Pre-placement Examination

A pre-placement examination should be completed by a physician who has been expert in toxicology of hazardous substances, on each new worker or transferee prior to employment in an area where exposure to carcinogens may

occur. The purpose of this examination is to establish a base line against which changes can be measured and to determine whether there exists any medical or other conditions which may lead to increased risk in the work situation. Specific test for particular target organ should be conducted.

14.1.2 It is suggested that while conducting pre-employment and periodical medical examination, patch test should be performed to find out whether a person is allergic to the carcinogenic substances. It will avoid skin disorders or any skin cancer.

14.2 Medical Examinations

The purpose of periodic medical examination is to determine whether a change in health status has occurred or if other conditions have developed which might lead to increased risk in the work situation. It should be noted, however, that it is unlikely these examinations can prevent the occurrence of cancer in an individual who is exposed to carcinogens. Specific regular biological monitoring test should be conducted for suspected type of cancer.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

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